1. 請說明肌肉細胞的細胞骨架 (cytoskeletons) 。(10%)

2. 請說明 Ca^{+2} channel 在細胞的分佈。(10%)

3. 請簡單敘述如何在初級培養鼠胚腦組織中區分 Neuron 或 Glia。(10%)

4. 請說明胚胎幹細胞 (Embryonic stem cells)的特性。(10%)

5. 請說明 extracellular matrix 的主要組成成分為何？(3%) ； basement membrane 的主要組成成分為何？(3%)

6. 請說明何謂 signal sequence? (3%)； 何謂 signal patch? (3%)

7. 請說明何謂 N-linked glycoprotein? (3%)； 何謂 O-linked glycoprotein? (3%)； 說明這兩種 glycosylation 是在細胞的何處所發生？(2%)

8. 由下列選項中，選出適當答案放入每一題之空格內，使各題成為完整而且正確的敘述。作答時請務必在答案卷上清楚標明題號及其 A、B 空格內的答案。(15%)
選項：
male; female; Western blotting; Southern blotting; Northern blotting; protein kinases; protein phosphatases; connexin; occludin; cadherin; collagen; cytochrome c; Bcl-2; apoptosis; in situ hybridization; immunohistochemistry

(a) Activation of cell surface receptors leads directly or indirectly to changes in protein phosphorylation, the addition and removal of phosphate groups from tyrosine, serine, and threonine residues. __A__ catalyze phosphorylation and __B__ catalyze dephosphorylation.

(b) Gap junctions are mainly formed by __A__.
The principal protein found in tight junction is __B__.

(c) __A__ molecules can control the release of __B__ from mitochondria, leading to cell death.

(d) The maturation process of __A__ gametes begins before birth and is completed after puberty. In contrast, the maturation of __B__ gametes begins at puberty and continues into old age.

(e) The total cellular RNA can be extracted, separated by gel electrophoresis, and subjected to __A__, which detects individual mRNA by hybridization to labeled commentary DNA probes. Likewise, cellular proteins can be extracted, separated electrophoretically, and subjected to __B__, a procedure in which individual proteins separated on the blot are detected with specific antibodies.

9. 解釋名詞：(6%)
(a) RNA interference
(b) clathrin coat

10. 請比較粒線體(mitochondria)之膜間空間 (intermembrane space)與基質(matrix)的組成與功能上的相異處。(10%)

11. 請說明核孔複合體(nuclear pore complex)的構造與功能。(9%)

試題隨卷繳回